

IN THE CLAIMS:

1. (~~Currently Amended~~) A system for providing multiline service, the system comprising:
a modem for exchanging communications signals with a communications network and for exchanging an incoming digital signal and an outgoing digital signal with a statistical multiplexor;
the statistical multiplexor for exchanging the incoming digital signal and the outgoing digital signal with the modem, for multiplexing a plurality of outgoing encoded telephonic call signals from a plurality of telephonic devices into the outgoing digital signal, and for demultiplexing the incoming digital signal into a plurality of incoming encoded telephonic call signals;
at least one call processing element coupled to the statistical multiplexor for converting the plurality of incoming encoded telephonic call signals into a plurality of incoming phone signals, and for converting a plurality of outgoing phone signals into the plurality of outgoing encoded telephonic call signals;
one or more bypassing elements positioned between the plurality of telephonic devices and the statistical multiplexor and operative to connect the plurality of telephonic devices either to the at least one call processing element or to the communications network;
control circuitry; and
customer premises equipment interface circuitry for providing at least one of the a group comprising: D.C. power, indications of on-hook and off-hook conditions, ring current, ring-back tones or busy tones; wherein the control circuitry communicates with the at least one call processing element and controls the customer premises equipment interface circuitry.

2. (~~Currently Amended~~) The system of claim 1, wherein the at least one call processing ~~unit~~ element encodes and decodes using Voice Over Internet protocol.

3. (Original) The system of claim 1, wherein the at least one call processing element exchanges signaling information with the communications network.

4. (~~Cancelled~~)

5. (Cancelled)

6. (Currently Amended) The system of claim 1, further comprising at least one data port coupled to the statistical multiplexor for exchanging a second portion of the encoded signals with the ^{telephonic call} a data device.

7. (Currently Amended) A system for simultaneously providing multiline phone and data service, the system comprising:

a modem for exchanging communications signals with a communications network and for exchanging an incoming digital signal and an outgoing digital signal with a statistical multiplexor;

the statistical multiplexor for exchanging the incoming digital signal and the outgoing digital signal with the modem, and for multiplexing an outgoing encoded telephonic call signal and an outgoing data signal into the outgoing digital signal, and for demultiplexing the incoming digital signal into an incoming encoded telephonic call signal and an incoming data signal;

a call processing element coupled to the statistical multiplexor for converting the incoming encoded telephonic call signal into an incoming phone signal, and for converting an outgoing phone signal into the outgoing encoded telephonic ^{call} signal;

one or more bypassing elements positioned between the a plurality of telephonic devices and the statistical multiplexor and operative to connect the plurality of telephonic devices either to the call processing element or to the communications network

control circuitry; and

customer premises equipment interface circuitry for providing at least one of the a group comprising: D.C. power, indications of on-hook and off-hook conditions, ring current, ring-back tones or busy tones; wherein the control circuitry communicates with the call processing element and controls the customer premises equipment interface circuitry.

8. (Currently Amended) The system of claim 7, wherein the call processing ~~unit~~ element encodes and decodes using Voice Over Internet Protocol.

9. (Original) The system of claim 7, wherein the call processing element exchanges signaling information with the communications network.

~~10. (Cancelled)~~

11. (Original) The system of claim 7, wherein the incoming and outgoing digital signals are exchanged with a personal computer, and the incoming and outgoing phone signals are exchanged with a telephone or a fax machine.

12. (~~Currently Amended~~) A system for providing multiline calls, the system comprising:
a modem for exchanging customer signals over a telephone line having encoded therein a set of multiline calls, and for communicating incoming and outgoing digital signals with a statistical multiplexor;

the statistical multiplexor for exchanging the digital signals with the modem, and for multiplexing at least one outgoing encoded telephonic call signal from a telephone network into the outgoing digital signal, and for demultiplexing the incoming digital signal into at least one incoming encoded telephonic call signal;

at least one call processor coupled to the statistical multiplexor for converting the at least one incoming and outgoing encoded telephonic call signals into at least one telephone network call, and for providing the at least one telephone network call to a gateway switch for communicating over the telephone network;

a control coupled to the at least one call processor for controlling the call processor and for exchanging signaling information with the gateway switch;

one or more bypassing elements positioned between the a plurality of telephonic devices and the statistical multiplexor and operative to connect the plurality of telephonic devices either to the at least one call processing element or to the ~~communications~~ telephone network;

control circuitry; and

customer premises equipment interface circuitry for providing at least one of ~~the~~ a group comprising: D.C. power, indications of on-hook and off-hook conditions, ring current, ring-back tones or busy tones; wherein the control circuitry communicates with the at least one call processor and controls the customer premises equipment interface circuitry.

13. (~~Currently Amended~~) The system of claim 12, further comprising a router coupled to the statistical multiplexor for routing packets to ~~the~~ an Internet or other data service; and wherein the set of multiline calls includes at least one telephonic and at least one data calls.

14. (Original) The system of claim 12, wherein the control also controls the modem and the statistical multiplexor.

15. (Original) The system of claim 12, wherein the call processor encodes and decodes using Voice Over Internet Protocol.

16. (Original) The system of claim 12, wherein the exchanged signaling information uses Signaling System 7 (SS7) protocols.

17. (~~Currently Amended~~) The system of claim 12, wherein the call processor encodes a telephone call signal originated from a remote device connected to ~~the~~ a public switched telephone network.

18. (~~Currently Amended~~) A computer-readable medium containing computer-executable instructions for performing steps comprising:

receiving a voice call setup request from a remote wall unit;

initiating a telephone call set-up over ~~the~~ a public switched telephone network using Signaling System 7 (SS7) protocols in response to receipt of the wall unit voice call setup request; and

connecting a call from the wall unit to the public switched telephone network by sending signaling messages to the wall unit in response to receipt of a SS7 messages from the public switched telephone network indicating the call is completed to a destination specified in the voice call setup message;

converting a Voice Over Internet Protocol encoded signal received from the wall unit to a voice signal recognizable by the public switched telephone network; and

converting a voice signal incoming from the public switched telephone network into a Voice Over Internet Protocol encoded signal for transmission to the wall unit.

19. (Original) The computer-readable medium of claim 18, comprising further computer-executable instructions for controlling a modem pool, a statistical multiplexor, and a call processor.

20. (Previously Presented) A communication system for providing multiline phone and data service over a single telephone line, the communication system comprising:

a wall unit configured to multiplex one or more residence-located analog and digital electronic devices onto the single telephone line;

a gateway server connected to an Internet Protocol (IP) network and in communication with a public switched telephone network (PSTN), with the gateway server being configured to route a voice related signal between the wall unit and the PSTN network and further configured to route a data related signal between the wall unit and the IP network; and

a gateway switch connected to the PSTN network and configured to connect the wall unit to the gateway server.

21. (Previously Presented) The communication system of claim 20, with the gateway server comprising:

a modem pool configured to provide an available modem to connect to and communicate with the gateway switch over a first telephone access line and therefore communicate with the wall unit through the PSTN;

a call processing configured to communicate with the gateway switch over a second telephone access line, convert voice-over-Internet-Protocol (VOIP) encoded signals received from the wall unit via the available modem into analog telephone signals to be transmitted over the PSTN, and convert analog telephone signals received from the PSTN network into VOIP encoded signals for transmission to the wall unit;

a statistical multiplexor in communication with the modem pool and with the call processing and configured to multiplex incoming signals received via the modem pool and the gateway switch to either the IP network or the PSTN network and further configured to multiplex signals received from the IP network and the PSTN network into a single signal to be transmitted to the wall unit through the gateway switch;

a router in communication with the statistical multiplexor and the IP network and configured to route signals to a destination on the IP network; and

a control in communication with the statistical multiplexor over a first signal line, the modem pool over a second signal line, the call processing over a third signal line, and the gateway switch over a fourth signal line, with the control configured to transmit and receive signaling information including call setup signals and termination signals.

22. (~~Currently Amended~~) The communication system of claim 20, with the wall unit comprising:

a modem for exchanging communications signals with a communications network and for exchanging an incoming digital signal and an outgoing digital signal with a statistical multiplexor;

the statistical multiplexor for exchanging the incoming digital signal and the outgoing digital signal with the modem, and for multiplexing an outgoing encoded telephonic call signal and an outgoing data signal into the outgoing digital signal, and for demultiplexing the incoming digital signal into an incoming encoded telephonic call signal and an incoming data signal;

a call processing element coupled to the statistical multiplexor for converting the incoming encoded telephonic call signal into an incoming phone signal, and for converting an outgoing phone signal into the outgoing encoded telephonic call signal;

one or more bypassing elements positioned between ~~the~~ a plurality of telephonic devices and the statistical multiplexor and operative to connect the plurality of telephonic devices either to the call processing element or to the communications network

control circuitry; and

customer premises equipment interface circuitry for providing at least one of ~~the~~ a group comprising: D.C. power, indications of on-hook and off-hook conditions, ring current, ring-back tones or busy tones; wherein the control circuitry communicates with the call processing element and controls the customer premises equipment interface circuitry.

23. (~~Currently Amended~~) A gateway server ~~adapted to communicate~~ that communicates with a wall unit in order to provide multiline phone and data service over a single telephone line, the gateway server comprising:

a modem pool configured to provide an available modem, with the available modem being ~~adapted to communicate~~ communicating with a gateway switch of a public switched telephone network (PSTN) over a first telephone access line and therefore communicate with the wall unit through the PSTN;

a call processing element ~~adapted to communicate~~ communicating with the gateway switch over a second telephone access line, convert voice-over-Internet-Protocol (VOIP) encoded signals received from the wall unit via the available modem into analog telephone signals to be transmitted over the PSTN, and convert analog telephone signals received from the PSTN network into VOIP encoded signals for transmission to the wall unit;

a statistical multiplexor in communication with the modem pool and with the call processing and configured to multiplex incoming signals received via the modem pool and the gateway switch to either an Internet Protocol (IP) network or the PSTN network and further configured to multiplex signals received from the IP network and the PSTN network into a single signal to be transmitted to the wall unit through the gateway switch;

a router in communication with the statistical multiplexor and the IP network and configured to route signals to a destination on the IP network; and

a control in communication with the statistical multiplexor over a first signal line, the modem pool over a second signal line, the call processing over a third signal line, and configured to communicate with the gateway switch over a fourth signal line, with the control configured to transmit and receive signaling information including call setup signals and termination signals.